

# Next Generation Modeling Technology for High Speed Rotorcraft, Phase II

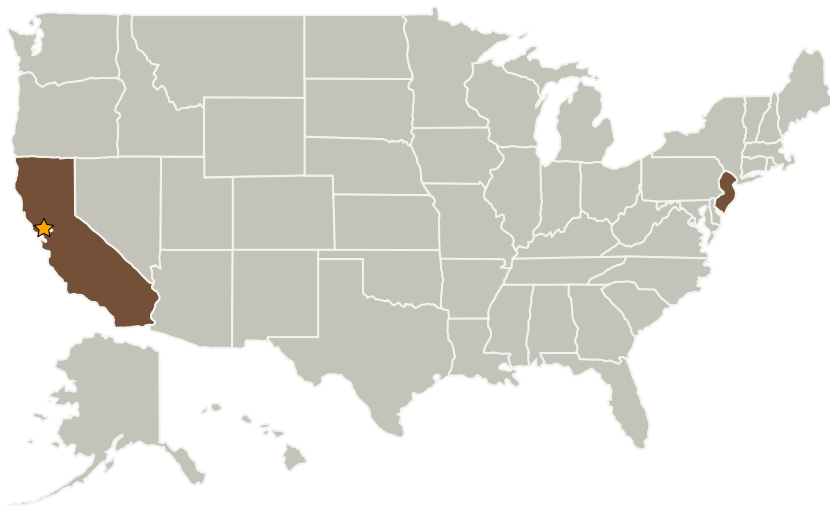
Completed Technology Project (2008 - 2010)



## Project Introduction

Development of a new generation of high speed rotorcraft has been hampered by both an absence of strong predictive methods for rotors operating at very high advance ratio and a dearth of relevant test data. Phase I initiated work on these challenges with rotor tests and development of enhanced analyses for high speed flight. Phase I testing produced useful data on model scale autorotating rotors at advance ratios up to 1.7, thereby supporting analysis development and laying the groundwork for further Phase II testing. Enhanced yawed flow models for comprehensive rotorcraft analyses were also investigated and an enhanced lifting surface blade/wake model was developed and validated for improved modeling in this regime. Additionally, Phase I studied CFD grid generation and flow analysis methods for improved modeling of reversed and strong spanwise flows. Phase II will see further high advance ratio rotor tests, up to 2.5, and CFD analysis supporting the development of new validated models suitable for extreme yawed flow. These new models will be incorporated into CDI's commercial rotorcraft aerodynamics software for immediate use in rotorcraft design and flight simulation codes. A hierarchy of models will be developed supporting applications ranging from high resolution CFD to real-time simulation.

## Primary U.S. Work Locations and Key Partners



Next Generation Modeling  
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Rotorcraft, Phase II

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Transitions	2
Project Management	2
Technology Areas	2

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Ames Research Center (ARC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Continuum Dynamics, Inc.	Supporting Organization	Industry	Ewing, New Jersey

## Primary U.S. Work Locations

California	New Jersey
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## Project Transitions

 **February 2008:** Project Start **June 2010:** Closed out

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX17 Guidance, Navigation, and Control (GN&C)
  - └ TX17.5 GN&C Systems Engineering Technologies
    - └ TX17.5.7 End-to-End Modeling and Simulation of GN&C Systems